

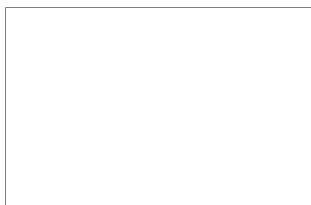
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**PHOTOGRAPHIC  
INTERPRETATION  
REPORT**

**NATIONAL PHOTOGRAPHIC  
INTERPRETATION CENTER**

**NEW ROCKET ENGINE TEST FACILITIES  
IN CHINA**



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**DECEMBER 1971**

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INSTALLATION OR ACTIVITY NAME					COUNTRY	
New Rocket Engine Test Facilities					CH	
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NA	See below	See below	See below	See below	See below	
MAP REFERENCE						
US Air Target Charts, see below						
LATEST IMAGERY USED			NEGATION DATE (if required)			
See below			NA			
REQUIREMENT			NPIC PROJECT			
NA			143321NH			

**Feng-chou Rocket Engine Test Facility**

33-56-50N 106-43-40E

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USATC, Series 200, Sheet 0384-14, scale 1:200,000

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**Wu-hsing Rocket Engine Test Facility**

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USATC, Series 200, Sheet 0492-6, scale 1:200,000

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**ABSTRACT**

1. Two rocket engine test facilities were identified in China at Feng-chou and Wu-hsing on photography of June and July 1971.

2. Feng-chou Rocket Engine Test Facility is located in a mountainous area in central China. It contains two vertical test stands for testing liquid propellant rocket engines. Construction on the test facility began in late 1965, and the test stands appeared operational early in 1970. Both test stands show evidence of test firings. Two nearby industrial plants, constructed concurrently with the test facility, may be large enough to produce and/or assemble rocket engines. This suggests that the function of the test facility may be production testing of rocket engines produced in the nearby plants.

3. Wu-hsing Rocket Engine Test Facility was under construction near the coast in the vicinity of Shang-hai. The facility includes two test buildings under construction. A vertical test stand for rocket engines is similar to the large test stand at Feng-chou; a horizontal test cell similar to a test cell at the Hu-ho-hao-te Solid Propellant Complex may be intended for solid propellant rocket motors. An unidentified area near the test cell will have several small barricaded buildings typical of solid propellant production and does not appear to be associated with liquid propellants. Upon completion, the Wu-hsing facility may have the capability to produce and test rocket motors as well as to test rocket engines and could therefore have a research and development function.

4. A detailed description of structures at Feng-chou is limited by the absence of the site, and some identifications at Wu-hsing are qualified because the facility was in a midstage of construction in August 1971, the date of most recent coverage. This report contains photographs of the test facilities, enlargements of the significant structures and areas, and drawings of the test buildings. Horizontal measurements of structures at Feng-chou are accurate

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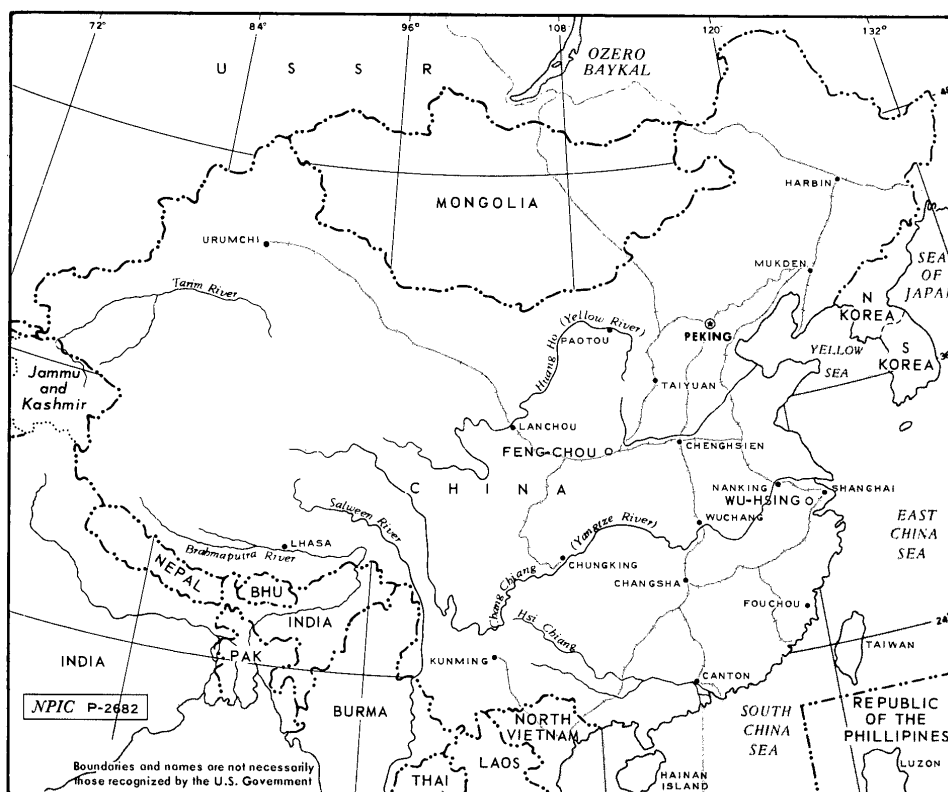
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**BASIC DESCRIPTION****Feng-chou Rocket Engine Test Facility**

5. Feng-chou Rocket Engine Test Facility (Figures 1 and 2) is located 112 nautical miles (nm) west-southwest of Hsi-an in a deep narrow ravine abutting a river valley. Principal access to the test facility is through a guarded entrance where the service road meets the valley road to Feng-chou.

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**FIGURE 1. LOCATIONS OF FENG-CHOU AND WU-HSING ROCKET ENGINE TEST FACILITIES AND SELECTED STRATEGIC INDUSTRIAL INSTALLATIONS**

6. The test facility has two vertical test stands and approximately 90 supporting buildings, including several barracks. Most of the supporting buildings are on the floor of the ravine, and the two test stands and some associated buildings are on the eastern, less steep side of the ravine. The test facility is not rail served, although a rail line runs through the town of Feng-chou, 5 nm to the west.

7. The facility was not present in July 1965, but construction probably began shortly after that date. Considerable construction was present when the test facility was first observed on KEYHOLE photography in September 1966. Most of the buildings in the facility appeared complete by December 1968.

#### Test Stands

8. Test Stand 1 (Figure 3) is the larger of the two test stands at Feng-chou. It is the oldest known liquid test stand of Chinese design. Test Stand 1 has two sections. The high rear section probably holds the propellant tanks and may serve as a checkout point for engines before and after testing. The front section encloses the engine test position. Detailed dimensions of test stands 1 and 2 are shown on Figure 3.

9. Test Stand 1 was in a midstage of construction in September 1966. The rear section of the stand was complete by December 1967; the front section had reached its final height at that time, but was not complete. Test stand 1 was externally complete by November 1968; the exhaust apron and coolant water collection basins below the stand were added between December 1969 and May 1970. The test stand was probably operational in early 1970. The surface of the exhaust apron showed evidence of some testing in June 1971.

10. Test Stand 2 also has a higher rear section and a front section enclosing the test position. The excavation for the exhaust trough and base of test stand 2 was present in December 1967, and the test stand had been constructed to the firing position level by November 1968. The test stand and exhaust trough were complete and probably operational in May 1970. Large dark stains were present on the surface of the exhaust trough in June 1971, indicating heavy use.

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**Industrial Plants**

11. Two industrial plants (Figure 2) were constructed concurrently with the test facility and may be associated with it. One plant is 2 nm west of the test facility and has about 35 major buildings. The other plant is just southeast of the test facility and contains 20 major buildings. Each plant is probably large enough to produce and/or assemble rocket engines. The Feng-chou test facility could perform production testing of any rocket engines produced and assembled at one or both of the nearby industrial plants.

**Wu-hsing Rocket Engine Test Facility**

12. Wu-hsing Rocket Engine Test Facility (Figures 1 and 4) is being constructed in the foothills of a low mountainous area about 25 nm north of Hang-chou and about 80 nm west-southwest of Shang-hai. It is not rail served. The Shang-hai vicinity includes shipyards, ship design centers, and the Naval Research Facility at Wu-hsi.

13. Construction on the test facility began between December 1969 and July 1971, when Wu-hsing was first observed on KEYHOLE photography. Construction progressed rapidly, and the facility was in a midstage of construction in August 1971.

14. The Wu-hsing test facility comprises several distinct areas separated by hills. The hilly terrain of the facility and the roads which go around the hills give the test facility a unique configuration. The main areas identifiable at present include a vertical test area for testing liquid propellant rocket engines and a horizontal test area possibly for testing solid propellant rocket motors. Also present are a housing area and two support areas. Although the function of a sixth area remains unidentified, the area could possibly become involved in solid propellant production. The possible combination of rocket engine testing and solid motor production and testing could indicate a research and development function for the Wu-hsing facility.

**Test Areas**

15. The vertical test area contains a vertical test stand (Figure 5) and eight other buildings complete and under construction. Two of the buildings are connected to the test stand by conduits or covered walkways. The test stand was nearly complete externally in August 1971. It is very similar in size and configuration to test stand 1 at Feng-chou (Figure 3). The high rear section is somewhat smaller than that at Feng-chou. Two slightly pitched-roof structures are on the top of the Wu-hsing stand, one next to the high rear section and one forward, over the approximate location of the test position (Figure 5).

16. The channel or exhaust trough at Wu-hsing is more sophisticated than the one which can be seen at Feng-chou. The Wu-hsing exhaust trough, below the level of the surrounding exhaust apron, extends straight out from the stand before tapering down in width and angling off to the side. Thirteen braces or conduits are positioned at intervals across the top of the trough.

17. Two propellant run tanks were observed near the top of the high rear section of the stand on

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The bottom of the tanks cannot be seen, but it is probably not below the level of the top of the front section of the stand. If the tanks extended below top of the front section, gravity flow problems might be introduced into the propellant feed system. The tanks, therefore, probably have a maximum capacity of approximately 47,900 gallons each.

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18. The horizontal test area contains a horizontal test cell (Figure 6) and two other major buildings, one complete and one in a very early stage of construction. The test cell itself was in a late stage of construction in August 1971. It consists of a single firing bay and a probable instrumentation section adjoining the rear of the firing bay. A concrete block rectangular exhaust trough is north of the firing bay.

19. The size of the firing bay and the length of the exhaust trough indicate the horizontal test cell will be used to test solid propellant rocket motors. The firing bay of the horizontal test cell is very similar to the firing bay of test cell 1 at the Hu-ho-hao-te Solid Propellant Complex. The firing bay of test cell 1 at Hu-ho-hao-te, and the firing bay of the test cell at Wu-hsing.

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exhaust trough at Wu-hsing extends [ ] from the front edge of the test cell, and the paved exhaust trough of test cell 1 at Hu-ho-hao-te is the same length.

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20. All but the very largest rocket motors, such as those used for strap-on space boosters, are test fired in the horizontal mode, requiring large blast deflectors or lengthy exhaust troughs of the type seen at Wu-hsing and Hu-ho-hao-te. Large rocket engines are generally tested in the vertical mode, and those smaller rocket engines tested horizontally do not require the long exhaust trough or large blast deflector associated with solid motor testing. For example, the distance between the front edge of the horizontal test building for rocket engines at Peking Guided Missile Development and Production Center Chang-hsin-tien [ ] and the end of the associated exhaust trough [ ]

An exhaust trough the size of the one at Wu-hsing would not be needed for horizontally testing small rocket engines.

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#### Unidentified Area

21. The function of the long, narrow area (Figure 7) north and west of the horizontal test cell is undetermined. In August 1971, at least 16 major buildings were observed complete or under construction in the southern half of the area.

22. At the north end of this area were six small clearings excavated in the hillside. The portions of the hillside between the clearings will form natural barricades for any buildings to be constructed in the clearings. Small barricaded buildings are not generally found at rocket engine test facilities, and there are no barricaded buildings at any other rocket engine test facility in China.

23. Small barricaded buildings are common at solid propellant plants, and solid motor production must be considered a possible function for this area. The group of larger buildings at the southern end of the area could possibly be for inert operations and rocket motor finishing.

24. The possibility that the horizontal test cell will be used for testing rocket motors strengthens the possibility that the unidentified area is for solid motor production. It is standard practice in the solid propellant industry to test rocket motors at the production site.

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**REFERENCES**

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**MAPS OR CHARTS**

Feng-chou

SAC. US Air Target Chart, Series 200, Sheet 0384-14, scale 1:200,000

Wu-hsing

ACIC. US Air Target Chart, Series 200, Sheet 0492-6, scale 1:200,000

**REQUIREMENT**

NPIC/IEG/SD/SIB Project 143321NH

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